

## **Countywide Multi-Jurisdictional Aerial Photography for San Mateo County**

### **Summary**

San Mateo County has spearheaded an effort to procure updated Countywide aerial photography that meets the functional requirements of a wide cross-section of County Public Sector stakeholders. Toward that end, County GIS staff, with involvement from City staff, LAFCO agencies, and CCAG have interviewed stakeholders, defined technical requirements, crafted an RFP, and selected a vendor to develop the product.

Requirements for the product include an ability to augment emergency planning, law enforcement, land use planning, and engineering workflows. Additionally, it is critical that the product integrate with the County's Enterprise GIS database.

The County has identified internal funding for half (\$240,000) of the project. The County is now soliciting partner agencies that may also benefit from these data to assist in making this project possible.

### **Cost and Schedule**

The total projected cost for the project excluding internal staffing and management requirements is \$480,000. Cost breakout as follows:

- \$330,000 for orthophotography
- \$100,000 for parcel/basemap rectification
- \$50,000 for implementation and distribution to partners

The County is intends to shoot the photos in October of 2005 and have all deliverables prepared by March of 2006.

### **Return On Investment**

This project will provide a product that streamlines many municipal government processes by working in a collaborative manner to meet the needs of many agencies.

### Known Applications

- Law Enforcement/Homeland Security: Common operating picture among disparate agencies, Survey incident locations, Crime analysis
- Planning: Landuse, Zoning, Detect permitting violations, Transportation planning
- Public Works/Infrastructure Management: Identification and mapping of field assets
- Assessment: Automate flagging of un-assessed improvements, viewshed analysis
- Public Health: Identify/track features that could cause/spread disease,

### Cost Savings

- Collaborative, county-wide effort will save hundreds of thousands of dollars for area and local government by purchasing a single Countywide product
- Save time – avoids or limits trips to the field for many community Planning applications
- Improved Level of Service for County Constituents by providing better data
- Would be used by county staff for presentation and information including non-technical
- Ability to create new map layers directly from imagery (planimetrics)
- Availability on the web

### **Brief Description of Product**

This project will generate 2 tangible products:

1. Color Digital Orthophotography
  - 3" pixel, 100 scale photography in urbanized areas
  - 6" pixel, 200 scale photography in rural areas
2. Rectified Countywide GIS Mapping Data, consisting of:
  - **Parcels** – area features of current assessors tax parcels, excluding air-parcels and personal property (mobile homes, boats, etc)
  - **Street Centerlines** – line features fully populated with street names, address ranges, and county road numbers.
  - **Right-of-Ways** – line features representing the public right-of-way, and in some cases the private roads of the county
  - **Street Name Annotation** – text features depicting street name for cartographic use
  - **Address Annotation** – text features depicting address for cartographic use

#### Color Digital Orthophotography

Digital orthophotography will be comprised of a set of approximately 680 files conforming to the County's Grid system and existing numbering scheme. Each file will cover 3000' (horizontal) x 2000' (vertical), and will be in color with 3" pixel resolution in tiles deemed "urban" and 6" resolution in tiles deemed "rural". There will be two formats, uncompressed TIFF/TFW and compressed SID/SDW i.e. two complete sets in each format will be prepared.

Two different horizontal accuracies will be flown. All urbanized areas along the coast, and on the San Francisco Bay east of Skyline Boulevard will adhere to 1" = 100' horizontal accuracy standards. The central and southern areas of the county within the Crystal Springs watershed and Regional Open Space areas will adhere to 1" = 200' scale horizontal accuracy standards. This is due to the density of tree cover and rural nature of these areas. These measures translate to approximately 2 – 2 ½ and 4-5 feet of horizontal error.

Anecdotally, these specifications are sufficient to identify manhole covers, with 0.7' precision, or to identify new construction monuments, and to measure (COGO) their position to within 1:36000 or about 1.25 feet in 3,000. Vertical accuracy will be sufficient to support 2-foot contours.

A Digital Elevation Model (DEM) will be provided in digital format and with sufficient density to support 2 foot contours. The DEM can and will be used to create a variety of 3-dimensional products.

#### Rectified Countywide GIS Mapping Data

Once the digital orthophotography is available the countywide GIS basemap will be adjusted to fit this new, more precise image base. The intent of the rectification process is to use the imagery and all available record sources on targeted areas to position the basemap so that it will never require further adjustment on this grand of a scale. Incidentally, it is the need to avoid this basemap rectification in the future that drives the need to procure the most precise imagery possible.

The target accuracy of basemap will be 2 feet horizontal. This specification has two intended stipulations. First, 2 feet will be the most that any lot line or right-of-way (ROW) line is allowed to diverge from the complimentary physical feature identified on the orthophotography. For example, a lot line should be within 2 feet of its corresponding fence line. Second, lot width and depth and ROW width should not exceed 2 feet from the reported distance from available record data.